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FISH & RICHARDSON, PC
4350 LA JOLLA VILLAGE DRIVE
SUITE 500
SAN DIEGO, CA 92122

EXAMINER

ENGLAND, DAVID E

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

1. Claims 1 – 30 are presented for examination.

Information Disclosure Statement

1. Prior art was disclosed with the application but there was no 1449 disclosure statement. If the attorney intended to disclosed prior art with the application, please submit a 1449 statement. If no prior art was intended on being disclosed with the application, then disregard above statement.

Claim Objections

1. Claim 15 is objected to because of the following informalities: A semicolon is missing from page 23, line 7. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 5, 7, 9, 10, 11, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld et al. U.S. Patent No. 5592622 (hereinafter Isfeld) in view of Klein et al. U.S. Patent No. 6134665 (hereinafter Klein).

3. Referencing claim 1, Isfeld teaches a processor, comprising:
 4. one or more processing engines to schedule transfers of data packets between the processor and the devices, (e.g. col. 8, line 50 – col. 9, line 15);
 5. a push engine to perform unsolicited transfers of the status data to the processing engines in response to the module collecting new status data, (e.g. col. 23, line 45 – col. 24, line 15).

Isfeld does not specifically teach a module configured to collect status data from devices connected to a bus, the status data indicating readiness of the devices to participate in data transfers over the bus. Klein teaches a module configured to collect status data from devices connected to a bus, the status data indicating readiness of the devices to participate in data transfers over the bus, (e.g. col. 1, line 50 – col. 2, line 8). It would have been obvious to one skilled in the art at the time the invention was made to combine Klein with Isfeld because if one device does not receive a type of status data (i.e. acknowledgement signal), transfer errors could accumulate in the system.

6. As per claim 2, Isfeld teaches wherein the processing engine comprises:
 7. one or more input transfer registers to receive the unsolicited transfers of status data for use to schedule the transfers of data packets, (e.g. col. 23, line 45 – col. 24, line 15).
8. As per claim 3, Isfeld teaches wherein the processing engine uses a portion of received new status data to schedule retrievals of data packets from the devices, (e.g. col. 10, line 46 – col. 11, line 46).

9. As per claim 4, Isfeld teaches wherein the processing engine uses a portion of the received status data to schedule transmissions of data packets, (e.g. col. 10, line 46 – col. 11, line 46).
10. As per claim 5, Isfeld teaches wherein the processing engine uses a portion of the received status data to determine whether schedule transmissions of data packets have been completed, (e.g. col. 18, lines 23 – 61).
11. As per claim 7, Isfeld teaches wherein a portion of the status data are flags indicative of whether associated devices have data packets to transmit, (e.g. col. 36, line 50 – col. 37, line 25).
12. Claims 9, 10, 11, 13 are rejected for similar reasons as stated above.
13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld (5592622) in view of Klein (6134665) in further view of Williams et al. (6144669) (hereinafter Williams).
14. As per claim 6, Isfeld and Klein do not specifically teach wherein the module is configured to poll the devices for the status data over a second bus. Williams teaches wherein the module is configured to poll the devices for the status data over a second bus, (e.g. col. 5, lines 29 – 59 & col. 11, lines 4 – 38). It would have been obvious to one skilled in the art at the time the invention was made to combine Williams with the combine system of Isfeld and Klein

because having the status data over a second bus could speed up a process and prevent latency and packet collision.

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld (5592622) in view of Klein (6134665) in further view of Shiraki et al. (5892979) (hereinafter).

16. As per claim 8, Isfeld and Klein do not specifically teach wherein a portion of the status data includes flags indicative of whether associated devices have space to receive data packets. Shiraki teaches wherein a portion of the status data includes flags indicative of whether associated devices have space to receive data packets. It would have been obvious to one skilled in the art at the time the invention was made to combine Shiraki with the combine system of Isfeld and Klein because this could prevent incoming status data to be written over the status data that already exists in the space provided.

17. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld (5592622) in view of Klein (6134665) in further view of Vaidya (6279113).

18. As per claim 12, Isfeld and Klein do not specifically teach wherein determining includes comparing a value of a time stamp transferred with the information to a previous value of the time stamp. Vaidya teaches wherein determining includes comparing a value of a time stamp transferred with the information to a previous value of the time stamp, (e.g. col. 12, lines 11 – 22). It would have been obvious to one skilled in the art at the time the invention was made to

combine Vaidya with the combine system of Isfeld and Klein because if one desired to save an updated status data the comparisons of the time stamp would allow for this function to take place. Therefore, leading to possible error prevention from the system accessing obsolete information.

19. Claims 14, 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld (5592622) in view of Klein (6134665) in further view of Witkowski et al. (6430626) (hereinafter Witkowski).

20. As per claim 14, Isfeld and Klein do not specifically teach wherein collecting further comprises:

21. polling the devices for ready status data on the availability of ports thereon; and
22. receiving ready status data associated with individual ones of the devices in response to the polling. Witkowski teaches wherein collecting further comprises:

23. polling the devices for ready status data on the availability of ports thereon, (e.g. col. 17, lines 33 – 58); and

24. receiving ready status data associated with individual ones of the devices in response to the polling, (e.g. col. 17, lines 33 – 58). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of Isfeld and Klein because if there are all ports are in use at the time the system cannot receive any data. Therefore, this would prevent bottle-necking.

25. As per claim 16, Isfeld and Klein do not specifically teach wherein the transferred portion of the information includes flags that indicate whether associated ports of the devices have one of space to receive data packets and data packets ready to transmit over the bus. Witkowski teaches wherein the transferred portion of the information includes flags that indicate whether associated ports of the devices have one of space to receive data packets and data packets ready to transmit over the bus, (e.g. col. 22, line 36 – col. 23, line 14 & col. 23, line 48 – col. 24, line 23). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of Isfeld and Klein because if there are all ports are in use at the time the system cannot receive any data. Therefore, this would prevent bottlenecking and packet collision.

26. Claim 17 is rejected for similar reasons as stated above.

27. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld (5592622) in view of Klein (6134665) in further view of Vaidya (6279113) in further view of Witkowski (6430626).

28. As per claim 15, Isfeld, Klein and Vaidya do not specifically teach wherein collecting further comprises:

29. writing the received ready status data to a status register;

30. scheduling transfers of data packets over the bus in response to the transferred portion of the ready status data. Witkowski teaches wherein collecting further comprises:

31. writing the received ready status data to a status register, (e.g. col. 34, line 45 – col. 35, line 25);

32. scheduling transfers of data packets over the bus in response to the transferred portion of the ready status data, (e.g. col. 17, lines 33 – 58). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of Isfeld, Klein and Vaidya because it would be more efficient to write received ready status data to a status register and if one wanted to transfer a type of response to the status data (i.e. acknowledgement) it would be more efficient for to transfer a portion of the status data for error checking.

33. Claims 18, 19 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulleedge (5644623).

34. Referencing claim 18, Ebrahim teaches a router, comprising:

35. a bus, (e.g. col. 1, lines 36 – 48); and

36. a parallel processor coupled to the bus and comprising, (e.g. col. 1, lines 36 – 48):

37. a plurality of processing engines to process data transfers with a plurality of devices connected to the bus, (e.g. col. 15, lines 19 – 37). Ebrahim does not specifically teach an interface connected to collect ready status data from the devices and to automatically transfer ready status data the processing engines in response to the status data being collected. Gulleedge teaches an interface connected to collect ready status data from the devices and to automatically transfer ready status data the processing engines in response to the status data being collected. It

would have been obvious to one skilled in the art at the time the invention was made to combine Gulleedge with Ebrahim because it would be faster if the status was automatically transfer once the status data was collected. This could aid in the shortening of latency.

38. As per claim 19, Gulleedge does not specifically teach wherein the ready status data indicates the readiness of individual ones of the devices to one of receive a data packet from and transmit a data packet to the parallel processor. Witkowski teaches wherein the ready status data indicates the readiness of individual ones of the devices to one of receive a data packet from and transmit a data packet to the parallel processor, (e.g. col. 5, line 59 – col. 6, line 39). It would have been obvious to one skilled in the art at the time the invention was made to combine Ebrahim with Gulleedge because it could lead to errors if the devices are not ready to transmit or receive data. This could prevent bottle-necking and packet collision.

39. As per claim 26, Ebrahim teaches wherein the devices are capable of transmitting data packets between the bus and external networks, (e.g. col. 3, lines 7 – 28).

40. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulleedge (5644623) in further view of Vaidya (6279113).

41. As per claim 20, Ebrahim and Gulleedge do not specifically teach wherein the ready status data includes a time stamp indicative of a staleness of the ready status data. Vaidya teaches wherein the ready status data includes a time stamp indicative of a staleness of the ready status

data, (e.g. col. 12, lines 11 – 22). It would have been obvious to one skilled in the art at the time the invention was made to combine Vaidya with the combine system of Ebrahim and Gulledge because if one desired to save an updated status data the comparisons of the time stamp would allow for this function to take place. Therefore, leading to possible error prevention from the system accessing obsolete information.

42. Claims 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulledge (5644623) in further view of Isfeld (5592622).

43. As per claim 21, Ebrahim and Gulledge do not specifically teach wherein a portion of the ready status data includes information to enable the processing engines to identify which scheduled data transfers to the devices have been completed. Isfeld teaches wherein a portion of the ready status data includes information to enable the processing engines to identify which scheduled data transfers to the devices have been completed, (e.g. col. 2, line 65 – col. 3, line 23). It would have been obvious to one skilled in the art at the time the invention was made to combine Isfeld with the combine system of Ebrahim and Gulledge because if the device does not know that the data transfer has been completed it could continually send the same data not knowing the status of the completely sent data, (i.e. acknowledgement signal). This would be used for error prevention.

44. As per claim 27, Ebrahim and Gulledge do not specifically teach wherein the interface transfers the collected status data without being solicited to transfer the data by the processing

engines. Isfeld teaches wherein the interface transfers the collected status data without being solicited to transfer the data by the processing engines, (e.g. col. 23, line 45 – col. 24, line 15). It would have been obvious to one skilled in the art at the time the invention was made to combine Isfeld with the combine system of Ebrahim and Gulleedge because it would be more efficient if data that was more important was to be transferred first. Furthermore, it would be faster if the data that was transmitted were unsolicited because the data would not use up time in unnecessary processing.

45. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulleedge (5644623) in further view of Witkowski (6430626).

46. As per claim 22, Ebrahim and Gulleedge do not specifically teach a ready bus capable of transferring ready status data from the devices to the interface. Witkowski teaches a ready bus capable of transferring ready status data from the devices to the interface, (e.g. col. 2, line 65 – col. 3, line 23). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of Ebrahim and Gulleedge because an error could occur if the data on the bus is not ready to transfer from the device to the interface.

47. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulleedge (5644623) in further view of Cotton et al. (5623489) (hereinafter Cotton).

48. As per claim 23, Ebrahim and Gulledge do not specifically teach wherein the ready status data indicates whether associated ports of the devices are ready to perform one of a transmission of a data packet to the bus and a receive of a data packet from the bus. Cotton teaches wherein the ready status data indicates whether associated ports of the devices are ready to perform one of a transmission of a data packet to the bus and a receive of a data packet from the bus, (e.g. col. 9, lines 8 – 35). It would have been obvious to one skilled in the art at the time the invention was made to combine Cotton with the combine system of Ebrahim and Gulledge because if there are all ports are in use at the time the system cannot receive any data. Therefore, this would prevent bottle-necking and packet collision.

49. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulledge (5644623) in further view of Vaidya (6279113) in further view of Cotton (6430626).

50. As per claim 24, Ebrahim, Gulledge and Vaidya do not specifically teach wherein each processing engine comprises at least one input transfer register; and

51. the interface is configured to write ready status data to one of the input transfer registers assigned to a to scheduler thread. Cotton teaches wherein each processing engine comprises at least one input transfer register, (e.g. col. 10, lines 15 – 44); and

52. the interface is configured to write ready status data to one of the input transfer registers assigned to a to scheduler thread, (e.g. col. 10, lines 15 – 44). It would have been obvious to one skilled in the art at the time the invention was made to combine Cotton with the combine system

of Ebrahim, Gulledge and Vaidya because it would be more efficient to write received ready status data to a status register and if one wanted to transfer a type of response to the status data (i.e. acknowledgement) it would be more efficient for to transfer a portion of the status data for error checking.

53. As per claim 25, Ebrahim, Gulledge and Vaidya do not specifically teach wherein the interface is configured to protect one of the input transfer registers from being read by the processing engines during the transferring of ready status data thereto. Cotton teaches wherein the interface is configured to protect one of the input transfer registers from being read by the processing engines during the transferring of ready status data thereto, (e.g. col. 16, lines 30 – 59). It would have been obvious to one skilled in the art at the time the invention was made to combine Cotton with the combine system of Ebrahim, Gulledge and Vaidya because this would be a more efficient way to protect status data that does not need to be processed by the processing engines. Therefore, this could help prevent errors from occurring in the system.

54. Claims 28 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Loughlin et al. (6275505) (hereinafter O'Loughlin) in view of Witkowski (6430626) in further view of Isfeld (5592622).

55. As per claim 28, O'Loughlin teaches an article comprising a computer-readable medium which stores executable instructions for transferring data packets over a bus, the instructions causing a processor to, (e.g. col. 10, lines 20 – 33):

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56. But, O'Loughlin does not specifically teach collect information on readiness of devices connected to the bus to one of transmit and receive data packets; and

57. transfer a portion of the collected information to a processing engine configured to schedule data transfers, the transferring being unsolicited by the processing engine. Witkowski teaches information on readiness of devices connected to the bus to one of transmit and receive data packets, (e.g. cols. 23 – 24). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with O'Loughlin because it would be more efficient to transmit and receive data when the devices is ready. If the device is not ready it could receive or transmit incorrect data leading to errors. Isfeld teaches transfer a portion of the collected information to a processing engine configured to schedule data transfers, the transferring being unsolicited by the processing engine, (e.g. col. 23, line 45 – col. 24, line 15). It would have been obvious to one skilled in the art at the time the invention was made to combine Isfeld with the combine system of O'Loughlin and Witkowski because it would be more efficient if data that was more important was to be transferred first. Furthermore, it would be faster if the data that was transmitted were unsolicited because the data would not use up time in unnecessary processing.

58. As per claim 29, O'Loughlin and Isfeld do not specifically teach the instructions further causing the processor to:

59. schedule data transfers with a portion of the devices based on the transferred portion of the collected information. Witkowski teaches the instructions further causing the processor to:

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60. schedule data transfers with a portion of the devices based on the transferred portion of the collected information, (e.g. col. 17, lines 33 – 58 & col. 34, line 45 – col. 35, line 25). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of O'Loughlin and Isfeld because of similar reasons stated above.

61. As per claim 30, O'Loughlin and Isfeld do not specifically teach the instructions further causing the processor to:

62. determine whether the transferred information is at least partly new; and

63. wherein instructions causing the processor to schedule are performed in response to

determining that the transferred information being at least partly new. Witkowski teaches the instructions further causing the processor to:

64. determine whether the transferred information is at least partly new, (e.g. col. 17, line 33 – col. 18, line 36); and

65. wherein instructions causing the processor to schedule are performed in response to

determining that the transferred information being at least partly new, (e.g. col. 17, line 33 – col.

18, line 36).). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of O'Loughlin and Isfeld because it would be more efficient for the user to determine the difference between partly new information and old information. This could lead to knowing when to update information in the system.

66. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

67. a. Muller et al. U.S. Patent No. 5938736 discloses search engine architecture for a high performance multi-layer switch element.

68.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David E. England whose telephone number is 703-305-5333. The examiner can normally be reached on Mon-Thur, 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on 703-308-5221. The fax phone numbers for the organization where this application or proceeding is assigned are none for regular communications and none for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is none.

David E. England
Examiner
Art Unit 2156

De *DE*
October 15, 2002



DAVID WILEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100